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NASA/DoD Aerospace Knowledge Diffusion Research Project

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Report Number 9

Summary Report to Phase 3 Faculty and Student Respondents Including Frequency Distributions

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INDIANA UNIVERSITY

THE NASA/DoD AEROSPACE KNOWLEDGE DIFFUSION RESEARCH PROJECT

Report to Phase Three Respondents
Faculty and Students

Introduction

This project, started in 1989, is designed to explore the diffusion of scientific and technical information (STI) throughout the aerospace industry. The increased international competition and cooperation in the industry promises to significantly affect the STI demands of U.S. aerospace engineers and scientists. Therefore, it is important to understand the aerospace knowledge diffusion process itself and its implications at the individual, organizational, national and international levels.

The project is planned in four phases. Phase 1 is designed to study the information-seeking methods of U.S. aerospace engineers and scientists. Phase 2 is concerned primarily with the transfer of scientific and technical information in industry and government and the role of librarians and technical information specialists in that transfer. Phase 3, reported in part here, examines the use of STI in the academic aerospace community. Phase 4 will examine knowledge, production, use and transfer of STI among non-U.S. aerospace organizations and aerospace engineers and scientists.

Part I

Data Collection Methods

Phase 3 of this project used three questionnaires that were sent to three groups in the academic aerospace community. The first group was information intermediaries in academic engineering libraries, the second group was faculty in aerospace departments, and the third group was students enrolled in a capstone design course.

The librarians surveyed were information intermediaries at engineering or aerospace libraries at institutions where a capstone design course was funded in 1989-90 by the University Space Research Association (USRA) and in universities with American Society of Engineering Education (ASEE) accredited aerospace programs. Libraries at each institution were called and the name of the librarian in charge of aerospace materials was obtained. This person was mailed the questionnaire. Of the 70 eligible respondents, 68 returned the questionnaire. Data collection began in late April, 1990 and continued through May, 1990. The results of this study will be reported separately.

The faculty sample was obtained primarily from institutions with USRA funded capstone courses in aerospace departments. Also included were some institutions with aerospace programs accredited by ASEE. Department chairs and USRA instructors were called and lists of their faculties were obtained when possible. The list was compared to a list of faculty surveyed for Phase 1 of this project, and those who had been surveyed previously were eliminated. Data collection began in mid-April of 1990 and continued through September 1990. Questionnaires were sent to 501 faculty, and 275 faculty responded to the survey.

The student sample was those students enrolled in an USRA-funded undergraduate capstone design course in Spring, 1990. Telephone calls and faxes to the course instructors enlisted the participation of the 39 eligible instructors who agreed to distribute the questionnaire. (Some instructors could not participate because they had taught their capstone course during the fall semester or did not have regularly scheduled meetings.) Data were collected during April and May, 1990. There were 640 student respondents from 29 institutions.

Descriptions of the Faculty and Students

We found that 16 percent of the students and three percent of the faculty were female. Most of each group (faculty, 83 percent; students, 95 percent) were U.S. citizens. Most students (92 percent) were seniors and 80

percent were majoring in aeronautical or astronautical engineering. Over 60 percent of the students were members of student chapters of the American Institute of Aeronautics and Astronautics (AIAA). Twenty-one percent of the students did not belong to any national professional group.
Two-thirds of the faculty belonged to AIAA and 36 percent belonged to the American Society of Mechanical Engineers.

Most faculty (69 percent) were trained as engineers and 89 percent had earned a Ph.D. Almost half were full professors (48 percent) and 64 percent were tenured. Seventeen percent of the faculty had authored a NASA technical report during the past three years. Two-thirds had some contact with NASA personnel as part of their faculty duties.

Part II

The Faculty and Student Questionnaires

Use and Rating of Information Resources

Most questions asked in the faculty survey were also asked in the student survey. There were some interesting differences between the two groups. The faculty rated their personal collections of STI as heavily used and very important in performing aerospace duties. Ninety-five percent said they used their collection frequently and an equal percentage said it was important. Among the students, 67 percent reported they used their collection frequently and 74 percent rated it as important. Eighty percent of the faculty reported they used journal articles frequently while only 52 percent of students did. And 74 percent of the faculty used conference and meeting papers frequently while 45 percent of the students did. Seventy-two percent of the students rated faculty members as an important information resource but only 54 percent of the faculty did.

Use and Importance of Information Sources and Products
(percents)

Source	Used Frequently		Very Important	
	Faculty	Students	Faculty	Students
Personal Collection	94.8	67.4	94.8	51.2
Journals	80.0	52.0	87.0	58.2
Conference/Meeting Papers	73.9	44.8	80.6	48.7
Textbooks	65.9	77.3	71.3	NA
University Library	45.0	44.0	65.2	54.7
(Other) Faculty	41.3	54.8	53.8	72.2
Engineering Library	37.3	45.5	52.5	56.9
NASA Technical Reports	37.1	50.5	49.8	54.7
NACA Technical Reports	20.0	19.0	27.4	25.1
(Other) Students	18.9	65.4	22.2	67.4
AGARD Technical Reports	10.7	5.6	18.8	11.3
Librarian	8.7	12.1	23.3	21.9

Use of NASA and AGARD Reports

Both groups used NASA technical reports. Only 17 percent of the faculty and 16 percent of the students reported they had not used NASA reports during the preceding school year. Students tended to use NASA reports more often than the faculty did, with 50 percent of students reporting frequent use. Only 37 percent of the faculty reported frequent use. These students may make more extensive use of NASA reports due to their

enrollment in the USRA course. Neither group used AGARD reports much. Only 48 percent of the faculty and 15 percent of the students reported using AGARD reports at all during the preceding academic year.

The respondents were asked to rate NASA technical reports on several factors. The reports were rated fairly highly by both groups although students tended to give lower ratings. Both groups found the reports to be high in technical quality, and low expense. They differed on accessibility and ease of use.

Rating of NASA Technical Reports
(percents)

Factors	Faculty	Students
Accessibility	50.7	36.5
Ease of Use	62.1	46.4
Expense	61.6	68.1
Technical Quality	71.4	67.8
Comprehensiveness	53.6	54.1
Relevance	56.0	54.5

Both groups were asked how frequently they had encountered problems working with NASA Technical Reports. Students reported that they had problems obtaining NASA reports more often than did the faculty. The problems cited most ofted were 1) it was not owned by the library, 2) it was missing or 3) it was housed somewhere else on campus. The faculty had more problems with reports that had to be obtained from NTIS or NASA. Students reported less cooperation from the library staff although neither group had many problems with staff assistance. Table One showed, however, limited use of library staff by both groups. Neither faculty nor students reported many problems with the quality of the reports.

Problems with NASA Technical Reports
(percents)

Problems	Faculty	Students
The library didn't own the report	34.7	43.4
The library owned the report, but it was missing	16.7	22.2
The library owned the report, but it was someplace else on campus	10.8	14.0
The report had to be obtained from either NTIS or NASA	25.5	20.3
Illegible microfiche	10.3	8.4
Illegible graphics	8.8	15.6
Intellectual quality of the research	10.3	12.5

Electronic Applications, Databases, and Software Packages

Each group was asked how often they used various electronic applications and software packages. Both faculty and students reported frequent use of word processing packages (faculty, 88 percent; students, 96 percent). Spell checkers were also heavily used (faculty, 63 percent; students, 84 percent). Sixty-five percent of the faculty frequently used scientific graphics and 71 percent of students did. Both groups used desktop publishing programs (faculty, 43 percent; students, 41 percent). The faculty also indicated frequent use of FAX or TELEX equipment (57 percent) while few students used them (9 percent). Faculty were also more inclined to be frequent users

of electronic mail (42 percent) and electronic networks (36 percent) than students (14 percent and 16 percent respectively). Students and faculty use electronic databases at about the same rate (students, 53 percent; faculty, 52 percent), and about 45 percent of each group reported frequent library use.

Skills for Success

Both students and faculty were asked about skills that are important for students to succeed in their engineering careers. About 97 percent of each group ranked the "ability to communicate technical information" as important and about 90 percent of each group felt that an "understanding and knowledge of engineering information resources" was important.

Students were asked about instruction they received in five skill areas. As might be expected, instruction in skills related to the communication of technical information were more widely available and taken than courses skills related to the understanding and use of engineering information sources. About three-fourths of the students reported receiving instruction in technical writing (74 percent) and oral presentations (78 percent). Smaller proportions (52 percent) received instruction in library use and engineering information resources (43 percent). One-third (34 percent) were taught to use online databases. Most students who did not receive instruction related to 1) library usage, 2) understanding and knowledge of engineering information sources, and 3) using online databases reported that such courses were not available or that they did not know if the courses were available.

Courses Available To Students (percents)

Courses Taken

Technical Writing	73.8
Oral Presentation	78.4
Department/Engineering Library	52.2
Engineering Information Resources	43.0
Online Databases	33.5

Courses Not Taken	Available	Not Available	Don't Know
Technical Writing	14.7	7.5	4.0
Oral Presentation	8.0	6.4	7.2
Department/Engineering Library	7.5	21.0	19.3
Engineering Information Resources	3.9	28.7	24.4
Online Databases	5.7	32.2	28.6

Students who did not take courses in these five skill areas, but who could have were asked why they did not take them. A total of 150 students wrote an answer. Because the number of students answering any one of the five questions was modest, no percentages are provided and readers should be cautious in the interpretation of the following information. The reasons offered for not taking these courses generally were that they already had the necessary skills; they intended to take the courses soon; or the instruction was offered in elective courses (in some cases, non-credit) that were difficult to schedule. Some who did not receive training in oral presentations reported that they had avoided these courses because they feared making presentations.[1]

[1]Of the thirty-eight students who answered this question, only four reported fear of oral presentations as the primary reason to not take the course.

Part III

Summary

Phase 3 of the NASA/DoD Aerospace Knowledge Diffusion Research Project was designed in part to discern similarities and differences between students and faculty members in their use of STI. Some broad patterns have emerged.

First, students do not use their personal collections of information to the degree that faculty members do, nor do they rate them as important as the faculty. This, like many differences between the two groups, may ultimately be due to the students' relative youth in the field. Students probably have not accumulated a large personal collection and cannot rely on it as much as the faculty. However, these limitations on their access to informal STI places a greater burden on the formal information system.

Secondly, students are more likely than faculty to complain about problems obtaining resources via the formal system. They found NASA technical reports more difficult to obtain and use than did the faculty. This problem may stem from two areas. First, students do not receive (or do not take) formal courses in using information resources and materials. Second, they have less experience in using the formal system. Both faculty and student perceive that an understanding and knowledge of information resources is less important to success than the ability to communicate technical information. But, students may be suffering because of their more limited abilities to use the information resources available to them.

ADDITIONAL INFORMATION ON THIS PROJECT

Phase 1 of this project is concerned primarily with the use and rating of STI by aerospace engineers and scientists. AIAA members were asked to review several information sources and rate them and to describe the patterns they use to gather the information they need. Analysis of these data is underway.

Phase 2 of this project focuses on the role of industry and government information intermediaries, (librarians) and technical information specialists in the transfer of STI. Intermediaries from government and industry libraries with aerospace collections from across the United States and Canada were asked to evaluate many of the information sources reviewed by the AIAA members. In addition, they provided us with information about how information sources are used in their libraries. Analysis of these data is currently being conducted.

Phase 4 began in summer, 1990 with a pilot study in Europe and Japan. A study of aerospace engineers and scientists in Britain is scheduled to begin in February, 1991. Additional surveys in NATO countries and Japan are planned.

If you would like additional information about any phase of this study or copies of reports that examine these data in more detail, please contact:

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We welcome your comments and suggestions.

NASA/DoD AEROSPACE KNOWLEDGE DIFFUSION RESEARCH PROJECT PUBLICATIONS

Reports

Pinelli, Thomas E.; Myron Glassman; Walter E. Oliu; and Rebecca O. Barclay. **Technical Communications in Aeronautics: Results of an Exploratory Study.** Washington, DC: National Aeronautics and Space Administration. NASA TM-101534, **Report 1, Part 1.** February 1989. 106 p. (Available from NTIS, Springfield, VA; 89N26772.)

Pinelli, Thomas E.; Myron Glassman; Walter E. Oliu; and Rebecca O. Barclay. **Technical Communications in Aeronautics: Results of an Exploratory Study.** Washington, DC: National Aeronautics and Space Administration. NASA TM-101534, **Report 1, Part 2.** February 1989. 84 p. (Available from NTIS, Springfield, VA; 89N26773.)

Pinelli, Thomas E.; Myron Glassman; Rebecca O. Barclay; and Walter E. Oliu. **Technical Communications in Aeronautics: Results of an Exploratory Study -- An Analysis of Managers' and Nonmanagers' Responses.** Washington, DC: National Aeronautics and Space Administration. NASA TM-101625, **Report 2.** August 1989. 58 p. (Available from NTIS, Springfield, VA; 90N11647.)

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Pinelli, Thomas E.; John M. Kennedy; and Terry F. White. **Summary Report to Phase 1 Respondents Including Frequency Distributions.** Washington, DC: National Aeronautics and Space Administration. NASA TM-102773, **Report 5.** January 1991. 53 p. (Available from NTIS, Springfield, VA.)

Pinelli, Thomas E. **The Relationship Between the Use of U.S. Government Technical Reports by U.S. Aerospace Engineers and Scientists and Selected Institutional and Sociometric Variables.** Washington, DC: National Aeronautics and Space Administration. NASA TM-102774, **Report 6.** January 1991. 350 p. (Available from NTIS, Springfield, VA.)

Pinelli, Thomas E.; John M. Kennedy; and Terry F. White. **Summary Report to Phase 2 Respondents Including Frequency Distributions.** Washington, DC: National Aeronautics and Space Administration. NASA TM-104063, **Report 7.** March 1991. 42 p. (Available from NTIS, Springfield, VA.)

Pinelli, Thomas E.; John M. Kennedy; and Terry F. White. **Summary Report to Phase 3 Respondents.** Washington, DC: National Aeronautics and Space Administration. NASA TM-104085, **Report 8.** April 1991. 8 p. (Available from NTIS, Springfield, VA.)

Papers

Pinelli, Thomas E.; Myron Glassman; Rebecca O. Barclay; and Walter E. Oliu. **The Value of Scientific and Technical Information (STI), Its Relationship to Research and Development (R&D), and Its Use by U.S. Aerospace Engineers and Scientists. Paper 1.** Paper presented at the European Forum "External Information: A Decision Tool" 19 January 1990, Strasbourg, France.

Blados, Walter R.; Thomas E. Pinelli; John M. Kennedy; and Rebecca O. Barclay. **External Information Sources and Aerospace R&D: The Use and Importance of Technical Reports by U.S. Aerospace Engineers and Scientists. Paper 2.** Paper prepared for the 68th AGARD National Delegates Board Meeting, 29 March 1990, Toulouse, France.

Kennedy, John M. and Thomas E. Pinelli. **The Impact of a Sponsor Letter on Mail Survey Response Rates. Paper 3.** Paper presented at the Annual Meeting of the American Association for Public Opinion Research, Lancaster, PA, May 19, 1990.

Pinelli, Thomas E. and John M. Kennedy. **Aerospace Librarians and Technical Information Specialists as Information Intermediaries: A Report of Phase 2 Activities of the NASA/DoD Aerospace Knowledge Diffusion Research Project. Paper 4.** Paper presented at the Special Libraries Association, Aerospace Division - 81st Annual Conference, Pittsburgh, PA, June 13, 1990.

Pinelli, Thomas E.; Rebecca O. Barclay; John M. Kennedy; and Myron Glassman. **Technical Communications in Aerospace: An Analysis of the Practices Reported by U.S. and European Aerospace Engineers and Scientists. Paper 5.** Paper presented at the International Professional Communication Conference (IPCC), Post House Hotel, Guilford, England, September 14, 1990.

Pinelli, Thomas E. and John M. Kennedy. **Aerospace Knowledge Diffusion in the Academic Community: A Report of Phase 3 Activities of the NASA/DoD Aerospace Knowledge Diffusion Research Project. Paper 6.** Paper presented at the 1990 Annual Conference of the American Society for Engineering Education - Engineering Libraries Division, Toronto, Canada, June 27, 1990.

Pinelli, Thomas E. and John M. Kennedy. **The NASA/DoD Aerospace Knowledge Diffusion Research Project: The DoD Perspective. Paper 7.** Paper presented at the Defense Technical Information Center (DTIC) 1990 Annual Users Training Conference, Alexandria, VA, November 1, 1990.

Pinelli, Thomas E.; John M. Kennedy; and Rebecca O. Barclay. **The Role of the Information Intermediary in the Diffusion of Aerospace Knowledge. Paper 8.** Reprinted from Science and Technology Libraries Volume 11, No. 2 (Winter) 1990: 59-76.

Eveland, J.D. and Thomas E. Pinelli. **Information Intermediaries and the Transfer of Aerospace Scientific and Technical Information (STI): A Report from the Field. Paper 9.** Paper Commissioned for Presentation at the 1991 NASA STI Annual Conference held at the NASA Marshall Space Flight Center, Huntsville, AL, April 9, 1991.

Pinelli, Thomas E.; John M. Kennedy; and Rebecca O. Barclay. **The NASA/DoD Aerospace Knowledge Diffusion Research Project. Paper 10.** Reprinted from Government Information Quarterly Volume 8, No 2 (1991): 219-233.

FREQUENCY DISTRIBUTIONS OF RESPONDENTS' ANSWERS

The following tables reflect the actual number of respondents answering each question in a specific way rather than the percentages of respondents choosing an answer. For most questions, all respondents were eligible to respond. However, for some questions, only respondents answering a previous question in a specific way were eligible. In some cases, a large number of respondents did not answer a question, although eligible to do so. Most of these questions had yes-no answers and it is safe to assume that "no answer" means no or did not use the information sources. Using actual frequency of response should provide readers with a clearer picture of the meaning of the data. Question order (and in some cases, question text) has been slightly modified for ease of presentation and reader use. Any reader with particular interest in the data may contact the authors for additional information and assistance.

Survey of Faculty in Aerospace Departments

275 Respondents

FACULTY SURVEY

How frequently during this past year did you use the following information sources to meet your engineering information needs?

	Frequently 1	2	3	4	Never 5	Not Available
Your personal collection of information	225	33	11	1	2	0
University library	54	68	78	50	21	0
Engineering or departmental library	39	62	68	31	19	52
Librarian	10	13	57	107	73	3
Personal contacts within aerospace companies	21	45	50	69	74	11
Your personal contacts at NASA/DoD labs	33	36	52	73	69	7
Faculty members at your university	36	76	97	54	8	0
Faculty members at other universities	9	40	72	88	54	4
Students	21	30	48	105	65	1

How important are the following information sources in meeting your engineering information needs?

	Very Important 1	2	3	4	Not at all Important 5	Not Available
Your personal collection of information	233	26	13	1	0	0
University library	111	65	52	34	7	1
Engineering or departmental library	73	70	48	20	14	47
Librarian	21	41	80	79	41	5
Your personal contacts within aerospace companies	37	54	62	63	39	16
Your personal contacts at NASA/DoD labs	64	45	61	40	41	17
Faculty members at your university	54	92	86	31	6	2
Faculty members at other universities	30	56	83	71	24	7
Students	21	39	66	90	52	2

How frequently during this past year did you use the following information products to meet your engineering information needs?

	Frequently 1	2	3	4	Never 5	Not Available
Conference/Meeting Papers	128	73	43	20	8	0
Journal Articles	152	68	34	17	4	0
Handbooks	35	42	70	81	40	0
Textbooks	89	91	66	24	3	0
Computer Programs and Documentation	36	59	69	66	40	0
Bibliographic, Numeric, Factual Databases	11	19	58	98	80	3
Theses/Dissertations	8	36	77	93	57	1
NACA Reports	13	42	49	68	100	2
NASA Reports	36	65	66	65	39	1
DoD Reports	3	35	52	76	99	5
AGARD Reports	6	23	39	73	124	5
Foreign Technical Reports	3	11	32	90	128	5
Technical Translations	1	7	21	94	143	5
Patents	1	2	4	37	215	8
Aerospace Company Technical Reports	8	22	41	84	109	7
University Technical Reports	2	31	73	102	60	2
Informal Information Products	18	47	70	82	53	1

How important are the following information products in meeting your engineering information needs?

	Very Important 1	2	3	4	Not at all Important 5	Not Available
Conference/Meeting Papers	155	62	33	12	7	0
Journal Articles	189	45	25	9	1	0
Handbooks	37	62	64	71	30	0
Textbooks	105	86	54	20	3	0
Computer Programs and Documentation	42	56	78	59	25	2
Bibliographic, Numeric, Factual Databases	10	39	71	93	45	6
Theses/Dissertations	16	48	94	74	31	4
NACA Reports	29	44	58	66	64	5
NASA Reports	64	70	56	51	24	4
DoD Reports	20	49	58	68	58	12
AGARD Reports	21	29	54	77	70	16
Foreign Technical Reports	5	21	44	104	81	11
Technical Translations	3	16	44	113	81	9
Patents	0	4	16	62	170	13
Aerospace Company Technical Reports	16	35	61	83	62	9
University Technical Reports	14	42	101	69	38	3
Informal Information Products	21	38	89	65	49	2

Approximately how many times during this past year did you use the following print sources in meeting your engineering information needs?

	None	1 - 5 Times	6 - 10 Times	More Than 10 Times	Lots/ Many	Not Familiar With
Applied Science and Technology Index	81	71	12	2	1	100
Engineering Index	80	85	21	6	0	74
Government Reports Announcement and Index	90	55	15	5	1	97
International Aerospace Abstracts	98	77	8	10	1	70
NASA SP-7037	99	47	5	0	0	108
NASA SCAN	97	36	4	9	1	110
NASA STAR	92	62	15	12	1	84
Science Citation Index	91	77	14	4	1	76

Approximately how many times this past year have you used the following electronic sources in meeting your engineering information needs?

Aerospace Database	80	23	0	0	0	147
COMPENDEX	65	10	0	0	0	177
DTIC DROLS	62	7	0	1	0	180
INSPEC	62	4	1	1	0	185
NASA RECON	66	26	3	2	1	152
NTIS Online	80	34	2	1	0	133
SCISEARCH	61	9	0	0	0	180
Wilson Line Index	58	3	1	1	0	190
BRS including "After Dark"	57	1	1	2	0	192
DIALOG including "Knowledge Index"	62	15	2	1	0	172

Which of the following best characterizes your use of online electronic databases?

I do all searches myself	24
I do most searches myself	40
I do half by myself and half through a librarian	22
I do most searches through a librarian	27
I do all searches through a librarian	57
I do not use electronic databases	88

How likely would you be to use the following if they were provided in electronic format?

	Very Likely 1	2	3	4	Not at all Likely 5
NASA STAR on CD-ROM	63	35	28	9	39
Full Text of NASA TRs on CD-ROM	84	41	32	16	29
NASA Computer Program Listings on CD-ROM	53	34	38	25	42
NASA Numerical/Factual Data on CD-ROM	48	33	42	28	39
NASA Photographs on CD-ROM	43	33	38	27	53
Online System with Full Text and Graphics for NASA Technical Reports	86	45	38	17	22

FACULTY SURVEY

How frequently in the past year did you use:

	Frequently 1	2	3	4	Never 5	Not Available
Electronic Databases	24	24	43	45	110	16
Laser/Video Disc/CD-ROM	8	14	19	31	147	40
Desktop/Electronic Publishing	69	43	33	22	80	13
Electronic Bulletin Boards	17	19	29	38	143	13
Electronic Mail	74	40	39	29	78	9
Electronic Networks	65	28	32	32	91	13
FAX/TELEX	87	66	51	27	35	5

How frequently during this past year did you use:

	Frequently 1	2	3	4	Never 5	Not Available
Word Processing	230	10	10	7	16	0
Spelling Checkers	144	26	23	24	51	0
Thesaurus	57	19	40	30	113	7
Grammar and Style Checkers	23	10	18	30	160	27
Outliners and Prompters	14	8	10	32	167	32
Business Graphics	25	15	22	37	150	17
Scientific Graphics	129	49	30	19	40	6

About how many times this past year did you use:

	None	1 - 5 Times	6 - 10 Times	More Than 10 Times	Lots/ Many
NASA Technical Reports	46	95	48	67	11
AGARD Technical Reports	137	93	15	15	3

What percentage of the NASA Technical Reports you used in the past year were in:

	0%	1-25%	26-50%	51-75%	76-100%
Paper	28	17	11	2	193
Microfiche	133	50	11	5	10

FACULTY SURVEY

During this past year how frequently did you encounter the following problems when obtaining NASA Technical Reports?

	Frequently 1	2	3	4	Never 5	Not Available
The library did not own the report	51	42	49	38	35	53
The library owned the report but it was missing	13	32	45	46	74	59
The library owned the report but it was stored someplace else on campus	11	18	23	35	110	71
The library staff was not cooperative or helpful in getting me the report	3	7	12	25	154	67
The report was classified or restricted	4	11	18	39	137	55
The report was available only to US Citizens	1	11	11	28	141	72
The report had to be obtained from NASA or NTIS	25	42	51	34	59	52

How frequently in the past year did you encounter the following problems when using NASA Technical Reports?

	Frequently 1	2	3	4	Never 5	Not Available
Illegible Microfiche	12	15	21	34	77	104
Illegible Text	4	12	27	43	105	71
Illegible Graphics	4	19	31	46	90	71
Poor Report Organization/ Presentation/Format	2	14	34	64	77	65
Intellectual Quality of the Research	6	18	39	53	49	70

How would you rate NASA Technical Reports on each of the following factors?

	Excellent 1	2	3	4	Poor 5
Accessibility	29	83	68	25	16
Ease of Use	34	107	75	10	1
Expense	41	78	60	13	1
Familiarity or Experience	30	77	66	13	2
Technical Quality or Reliability	45	115	55	8	1
Comprehensiveness	28	93	90	12	3
Relevance	36	90	77	18	4
Physical Proximity	26	60	75	33	15
Skill in Use	23	71	89	14	2
Timeliness	18	60	88	15	7

FACULTY SURVEY

How important do you think it is for the professional success of your engineering students to:					
	Very Important 1	**2**	**3**	**4**	**Not at all Important 5**
Communicate Technical Information Effectively?	238	28	4	0	0
Have an Understanding and Knowledge of Engineering Information Resources and Materials?	162	87	19	3	0

Gender:		**US Citizen:**	
Female	8	Yes	227
Male	264	No	46

Highest level of education completed:		**Were you trained as:**	
Bachelor's Degree	4	Engineer	188
Master's Degree	25	Scientist	52
Ph.D. or Sc.D.	219	Both	25
Postdoctorate	23	Other	7
Other	2		

Do you hold a faculty position?		**Rank held:**	
Yes	269	Professor	122
No	4	Associate	53
Tenured:		Assistant	54
		Adjunct	7
Yes	172	Instructor	7
No	80	Other	11
Not Applicable	15		

In the past year have you worked on a NASA or DoD grant or contract other than the USRA "Advanced Engineering Design Program"?	
Yes	**153**
No	**119**

FACULTY SURVEY

Professional membership: (more than one could be circled)			
AIAA	183	SAE	18
ASME	99	Other	157
IEEE	35	None	9

Years of professional work experience in aerospace:						
	0 Years	**1 - 5 Years**	**6 - 10 Years**	**11 - 20 Years**	**21 - 30 Years**	**More Than 30**
Academia or Not-for-Profit	2	73	48	51	62	19
Government	32	49	13	10	5	2
Industry	18	66	30	16	3	1
Total Years	8	44	31	55	72	43

During the past 3 years, have you authored or co-authored any NASA Technical Reports?		**Number of NASA Technical Reports authored or co-authored:**	
Yes	46	One	21
No	224	Two	12
		Three	3
		Four	5
		Five	1
		Six	2

During the past 3 years, have you attended NASA sponsored or co-sponsored conferences or workshops?		**Number of NASA conferences or workshops attended:**	
Yes	149	One - Five	123
No	123	Six - Ten	18
		More than Ten	2

In performing your duties as a faculty member during the past year, have you contacted or been contacted by NASA personnel?		**Number of contacts with NASA personnel:**	
Yes	181	One - Five	101
No	91	Six - Ten	36
		More than Ten	24
		Lots/Many	14

Survey of Students in USRA-Funded Capstone Courses

640 Respondents

STUDENT SURVEY

How frequently during this past year did you use the following information sources to meet your engineering information needs?

	Frequently 1	2	3	4	Never 5	Not Available
Your personal collection of information	268	162	114	59	23	9
University library	147	133	164	132	58	3
Engineering or departmental library	147	142	125	73	64	84
Librarian	22	54	134	190	217	11
Personal contacts within aerospace companies	23	57	83	129	238	103
Your personal contacts at NASA/DoD labs	15	46	61	69	292	148
Faculty members at your university	149	197	170	94	18	3
Other students	194	222	135	59	23	4

How important are the following information sources in meeting your engineering information needs?

	Very Important 1	2	3	4	Not at all Important 5	Not Available
Your personal collection of information	309	162	90	51	18	5
University library	175	172	131	97	58	2
Engineering or departmental library	226	135	99	56	33	86
Librarian	49	89	138	179	167	8
Personal contacts within aerospace companies	73	97	94	110	138	118
Your personal contacts at NASA/DoD labs	74	66	68	88	178	153
Faculty members at your university	253	205	112	49	13	2
Other students	216	211	119	63	23	1

STUDENT SURVEY

How frequently during this school year did you use the following information products to meet your engineering information needs?

	Frequently 1	2	3	4	Never 5	Not Available
Conference/Meeting Papers	131	154	142	97	100	12
Journal Articles	135	196	153	104	44	4
Handbooks	101	179	168	117	58	7
Textbooks	314	177	82	41	17	4
Computer Programs and Documentation	140	139	128	112	108	11
Bibliographic, Numeric, Factual Databases	51	76	121	167	196	23
NACA Reports	45	74	91	130	244	42
NASA Reports	150	172	125	93	81	17
DoD Reports	13	30	67	93	362	68
AGARD Reports	12	23	32	66	392	96
Foreign Technical Reports	7	16	35	77	416	80
Technical Translations	5	15	38	75	426	70
Patents	3	4	22	32	488	81
Aerospace Company Technical Reports	52	110	127	130	172	44
University Technical Reports	30	99	153	116	202	31
Informal Information Products	57	99	155	166	142	14

How important are the following information products in meeting your engineering information needs?

	Very Important 1	2	3	4	Not at all Important 5	Not Available
Conference/Meeting Papers	150	156	143	96	70	13
Journal Articles	186	180	151	72	35	5
Handbooks	133	187	175	83	44	3
Computer Programs and Documentation	146	142	145	110	73	13
Bibliographic, Numeric, Factual Databases	63	89	150	144	151	26
Theses/Dissertations	39	86	148	156	169	24
NACA Reports	66	90	102	123	183	56
NASA Reports	185	159	121	73	67	24
DoD Reports	47	50	98	112	223	89
AGARD Reports	36	33	61	92	262	124
Foreign Technical Reports	16	20	68	99	326	96
Technical Translations	17	32	67	108	307	94
Patents	11	15	43	97	361	96
Aerospace Company Technical Reports	102	105	161	102	110	48
University Technical Reports	69	122	152	110	140	32
Informal Information Products	86	128	152	119	124	20

Approximately how many times during this school year did you use the following print sources in meeting your engineering information needs?

	None	1 - 5 Times	6 - 10 Times	More Than 10 Times	Lots/ Many	Not Familiar With
Applied Science and Technology Index	53	152	28	29	6	354
Engineering Index	55	152	35	20	7	355
Government Reports Announcement and Index	65	136	24	18	3	379
International Aerospace Abstracts	64	160	34	31	7	325
NASA SP-7037	58	108	28	16	4	406
NASA SCAN	66	27	5	1	2	519
NASA STAR	55	77	23	23	7	439
Science Citation Index	70	39	7	5	1	500

Approximately how many times during this school year did you use the following electronic sources in meeting your engineering information needs?

Aerospace Database	57	37	1	3	5	513
COMPENDEX	33	7	2	1	0	580
DTIC DROLS	32	6	0	0	0	584
INSPEC	33	3	0	0	0	586
NASA RECON	40	39	5	0	0	535
NTIS Online	38	26	10	12	3	535
SCISEARCH	34	7	1	1	0	576
Wilson Line Index	36	21	16	11	2	536
BRS including "After Dark"	37	1	1	1	0	583
DIALOG including "Knowledge Index"	37	9	2	3	0	572

Which of the following best characterizes your use of online electronic databases?

I do all searches myself	122
I do most searches myself	149
I do half by myself and half through a librarian	43
I do most searches through a librarian	29
I do all searches through a librarian	20
I do not use electronic databases	256

How likely would you be to use the following if it was provided in electronic format?

	Very Likely 1	2	3	4	Not at all Likely 5
NASA STAR on CD-ROM	162	84	57	17	29
Full text of NASA TRs on CD-ROM	238	115	60	23	22
NASA Computer Program Listings on CD-ROM	185	98	77	41	41
NASA Numerical/Factual Data on CD-ROM	168	124	77	37	31
NASA Photographs on CD-ROM	217	103	74	42	29
Online system with full text and graphics for NASA Technical Reports	274	111	58	24	16

STUDENT SURVEY

How frequently during this school year did you use:

	Frequently 1	2	3	4	Never 5	Not Available
Electronic Databases	84	76	82	89	218	74
Laser/Video Disc/CD-ROM	36	60	49	55	286	133
Desktop/Electronic Publishing	167	87	53	35	195	83
Electronic Bulletin Boards	18	20	52	52	373	106
Electronic Mail	44	44	64	64	315	92
Electronic Networks	49	50	62	54	317	89
FAX/TELEX	24	34	58	79	332	101

How frequently during this school year did you use:

	Frequently 1	2	3	4	Never 5	Not Available
Word Processing	568	40	14	2	7	1
Spelling Checkers	472	54	20	20	60	4
Thesaurus	169	55	76	61	231	36
Grammar and Style Checkers	65	21	47	45	355	92
Outliners and Prompters	44	19	53	52	370	84
Business Graphics	105	62	51	58	299	46
Scientific Graphics	334	112	61	24	68	27

About how many times during this school year did you use:

	None	1 - 5 Times	6 - 10 Times	More Than 10 Times	Lots/ Many
NASA Technical Reports	101	259	112	128	11
AGARD Technical Reports	475	63	11	6	1

What percentage of the NASA technical reports you used in the school year were in:

	0%	1-25%	26-50%	51-75%	76-100%
Paper	113	65	60	40	315
Microfiche	287	78	61	28	81

STUDENT SURVEY

During this school year, how frequently did you encounter the following problems when obtaining NASA Technical Reports?

	Frequently 1	2	3	4	Never 5	Not Available
The library did not own the report	153	118	93	67	82	112
The library owned the report but it was missing	67	72	117	94	155	120
The library owned the report but it was stored someplace else on campus	35	52	66	64	257	147
The library staff was not cooperative or helpful in getting me the report	19	28	38	81	321	136
The report was classified or restricted	21	27	46	50	327	147
The report was available only to US citizens	11	8	19	24	341	218
The report had to be obtained from NASA or NTIS	67	59	62	37	243	153

During this school year, how frequently did you encounter the following problems when using NASA Technical Reports?

	Frequently 1	2	3	4	Never 5	Not Available
Illegible Microfiche	19	33	57	64	242	205
Illegible Text	11	33	54	98	294	133
Illegible Graphics	34	63	85	97	215	127
Poor Report Organization/ Presentation/Format	11	29	90	142	226	124
Intellectual Quality of the Research	26	49	85	94	206	141

How important do you think it is for your success as an engineer to:

	Very Important 1	2	3	4	Not at all Important 5
Communicate Technical Information Effectively?	522	74	13	2	1
Have an Understanding and Knowledge of Engineering Information Resources and Materials?	371	170	42	18	8

*To what extent do you think the following factors influence your use of NASA Technical Reports?

	Greatly Influenced 1	2	3	4	Not Influenced 5
Accessibility	101	53	61	15	44
Ease of Use	49	61	69	35	57
Skill in Use	37	57	78	37	62
Expense	32	33	47	29	129
Familiarity or Experience	67	50	60	35	62
Technical Quality or Reliability	61	66	62	17	64
Comprehensiveness	48	67	69	28	59
Relevance	72	84	60	18	35
Physical Proximity	67	63	51	32	56
Timeliness	52	64	62	25	65

*How would you rate NASA technical reports on each of the following factors?

	Very Accessible 1	2	3	4	Not Accessible 5
Accessibility	23	88	114	65	14
	Easy to Use 1	**2**	**3**	**4**	**Not Easy To Use 5**
Ease of Use	28	114	106	48	10
Skill in Use	34	98	107	52	8
	Not Expensive 1	**2**	**3**	**4**	**Very Expensive 5**
Expense	93	67	50	19	6
	Very Familiar 1	**2**	**3**	**4**	**Not at all Familiar 5**
Familiarity or Experience	19	74	106	61	34
	Excellent 1	**2**	**3**	**4**	**Poor 5**
Technical Quality or Reliability	67	129	71	19	3
Comprehensiveness	39	115	100	31	7
	Highly Relevant 1	**2**	**3**	**4**	**Not at all Relevant 5**
Relevance	45	119	101	35	1
	Close 1	**2**	**3**	**4**	**Far 5**
Physical Proximity	65	87	82	31	23
	Very Timely 1	**2**	**3**	**4**	**Not at all Timely 5**
Timeliness	18	72	111	47	6

*There were two versions of the questionnaire; approximately one-half the students were asked each question.

Have you received instruction in:	Yes	No
Technical Writing	461	167
Oral Presentations	491	137
Use of Engineering or Dept Library	321	300
Engineering Information Resources and Materials	265	360
Searching Online Databases	204	418

Was instruction available to you in:	Yes	No
Technical Writing	92	47
Oral Presentations	50	40
Use of Engineering or Dept Library	46	129
Engineering Information Resources and Materials	24	177
Searching Online Databases	35	196

Was instruction in technical writing:	
A credit course	322
A non-credit course	7
A required course	282
An elective course	42
As part of an engineering course	189
As part of another course	63
As a separate course	130

Was instruction in oral presentations:	
A credit course	301
A non-credit course	23
A required course	236
An elective course	64
As part of an engineering course	247
As part of another course	122
As a separate course	75

Was instruction in how to use the engineering or departmental library:	
A credit course	59
A non-credit course	19
A required course	55
An elective course	11
As part of an engineering course	140
As part of another course	68
As a separate course	8

Was instruction in engineering information resources and materials:	
A credit course	53
A non-credit course	9
A required course	40
An elective course	11
As part of an engineering course	154
As part of another course	39
As a separate course	5

Was instruction in searching online databases:	
A credit course	30
A non-credit course	15
A required course	21
An elective course	12
As part of an engineering course	52
As part of another course	51
As a separate course	7

STUDENT SURVEY

Gender:		US Citizen:	
Female	102	Yes	595
Male	519	No	28

In the past school year have you worked on a NASA or DoD grant or contract other than the USRA "Advanced Engineering Design Program"?	
Yes	**97**
No	**519**

Professional (national) student membership: (more than one could be circled)			
AIAA	361	SAE	7
ASME	38	Other	52
IEEE	4	None	126

Year in school:	
Junior	7
Senior	574
Graduate Student	40
Other	5

Co-op student (past or current)	
Yes	101
No	506

Major:	
Aero/Astro Engineering	499
Architecture	26
Civil Engineering	8
Electrical Engineering	9
Mechanical Engineering	71
Physics	1
Other Engineering	3
Other	4

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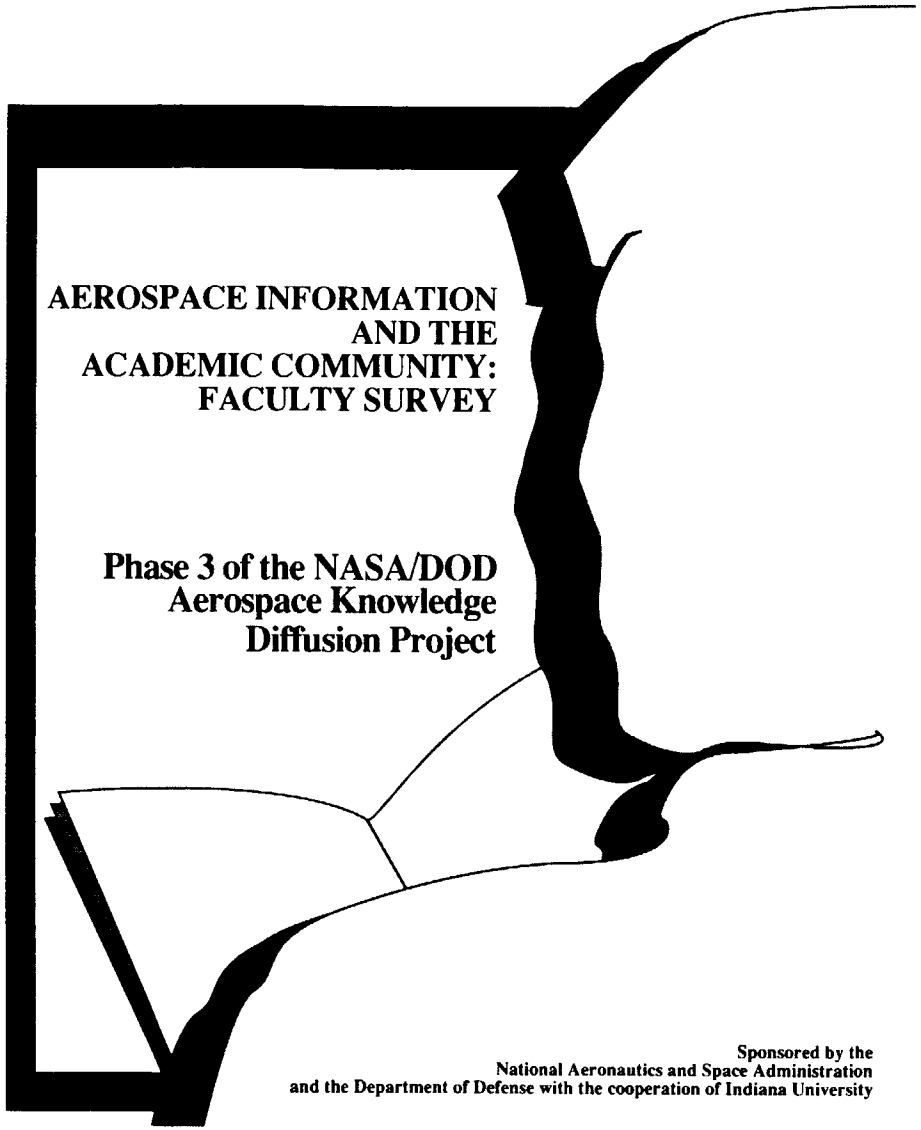


These data will help us determine the use and importance of information by engineering faculty.

1. How frequently during this past year did you use the following information **sources** to meet your engineering information needs? (Circle number)

	Frequently				Never	Not Available
Your personal collection of information	1	2	3	4	5	9
University library	1	2	3	4	5	9
Engineering or departmental library	1	2	3	4	5	9
Librarian	1	2	3	4	5	9
Your personal contacts within aerospace companies	1	2	3	4	5	9
Your personal contacts at NASA/DOD labs	1	2	3	4	5	9
Faculty members at your university	1	2	3	4	5	9
Faculty members at other universities	1	2	3	4	5	9
Students	1	2	3	4	5	9

2. How frequently during this past year did you use the following information **products** to meet your engineering information needs? (Circle number)

	Frequently				Never	Not Available
Conference/meeting papers	1	2	3	4	5	9
Journal articles	1	2	3	4	5	9
Handbooks	1	2	3	4	5	9
Textbooks	1	2	3	4	5	9
Computer programs and documentation	1	2	3	4	5	9
Bibliographic, numeric, factual databases	1	2	3	4	5	9
Theses/dissertations	1	2	3	4	5	9
NACA reports	1	2	3	4	5	9
NASA reports	1	2	3	4	5	9

Frequency of use

	Frequently				Never	Not Available
DOD reports	1	2	3	4	5	9
AGARD reports	1	2	3	4	5	9
Foreign technical reports	1	2	3	4	5	9
Technical translations	1	2	3	4	5	9
Patents	1	2	3	4	5	9
Aerospace company technical reports	1	2	3	4	5	9
University technical reports	1	2	3	4	5	9
Informal information products (e.g., vendor/supply catalogs, company literature, trade journals/magazines)	1	2	3	4	5	9

3. How important are the following information **sources** in meeting your engineering information needs? (Circle number)

	Very Important				Not at all Important	Not Available
Your personal collection of information	1	2	3	4	5	9
University library	1	2	3	4	5	9
Engineering or departmental library	1	2	3	4	5	9
Librarians	1	2	3	4	5	9
Your personal contacts within aerospace companies	1	2	3	4	5	9
Your personal contacts at NASA/DOD labs	1	2	3	4	5	9
Faculty members at your university	1	2	3	4	5	9
Faculty members at other universities	1	2	3	4	5	9
Students	1	2	3	4	5	9

4. How important are the following information **products** in meeting your engineering information needs? (Circle number)

	Very Important				Not at all Important	Not Available
Conference/meeting papers	1	2	3	4	5	9
Journal articles	1	2	3	4	5	9
Handbooks	1	2	3	4	5	9
Textbooks	1	2	3	4	5	9
Computer programs and documentation	1	2	3	4	5	9
Bibliographic, numeric, factual databases	1	2	3	4	5	9
Theses/dissertations	1	2	3	4	5	9
NACA reports	1	2	3	4	5	9
NASA reports	1	2	3	4	5	9
DOD reports	1	2	3	4	5	9
AGARD reports	1	2	3	4	5	9
Foreign technical reports	1	2	3	4	5	9
Technical translations	1	2	3	4	5	9
Patents	1	2	3	4	5	9
Aerospace company technical reports	1	2	3	4	5	9
University technical reports	1	2	3	4	5	9
Informal information products (e.g., vendor/ supply catalogs, company literature, trade journals/magazines)	1	2	3	4	5	9

5. Approximately how many times during this past year did you use the following **print** sources in meeting your engineering information needs?

PRINT SOURCES	Times this Past Year	Not Familiar With (✓)
Applied Science and Technology Index	_____	( )
Engineering Index	_____	( )

PRINT SOURCES

	Times this Past Year	Not Familiar With (✓)
Government Reports Announcement and Index	_____	( )
International Aerospace Abstracts	_____	( )
NASA SP-7037 (Aeronautical Engineering- A Continuing Bibliography With Indexes)	_____	( )
NASA SCAN	_____	( )
NASA STAR	_____	( )
Science Citation Index	_____	( )

These data will help us determine the use of information technology by engineering faculty.

6. Approximately how many times this past year have you used the following **electronic** sources in meeting your engineering information needs?

ONLINE (ELECTRONIC) DATABASES	Times this Year	Not Familiar With (✓)
Aerospace Database	_____	( )
COMPENDEX	_____	( )
DTIC DROLS	_____	( )
INSPEC	_____	( )
NASA RECON	_____	( )
NTIS Online	_____	( )
SCISEARCH	_____	( )
Wilson Line Index	_____	( )
BRS including "After Dark"	_____	( )
DIALOG including "Knowledge Index"	_____	( )

7. Which of the following **best** characterizes your use of online electronic databases? (Circle number)

1 I do **all** searches myself
2 I do **most** searches myself

Online electronic databases

3 I do **half** by myself and **half** through a librarian
4 I do **most** searches through a librarian
5 I do **all** searches through a librarian
6 I do **not use** electronic databases

8. How likely would you be to use the following if they were provided in **electronic format?** (Circle number)

	Very Likely				Not at all Likely	Don't Know
NASA STAR on CD-ROM	1	2	3	4	5	9
Full text of NASA Technical Reports on CD-ROM	1	2	3	4	5	9
NASA Computer Program Listings on CD-ROM	1	2	3	4	5	9
NASA Numerical/Factual Data on CD-ROM	1	2	3	4	5	9
NASA Photographs (Images) on CD-ROM	1	2	3	4	5	9
Online system with full text and graphics for NASA technical reports	1	2	3	4	5	9

9. How frequently during this past year did you use the following **computer applications**? (Circle number)

	Frequently				Never	Not Available
Electronic databases	1	2	3	4	5	9
Laser/Video Disc/CD-ROM	1	2	3	4	5	9
Desktop/electronic publishing	1	2	3	4	5	9
Electronic bulletin boards	1	2	3	4	5	9
Electronic Mail	1	2	3	4	5	9
Electronic networks	1	2	3	4	5	9
FAX/TELEX	1	2	3	4	5	9

10. How frequently during this past year did you use the following **software**? (Circle number)

	Frequently				Never	Not Available
Word Processing	1	2	3	4	5	9
Spelling Checkers	1	2	3	4	5	9
Thesaurus	1	2	3	4	5	9
Grammar and Style Checkers	1	2	3	4	5	9
Outliners and Prompters	1	2	3	4	5	9
Business Graphics	1	2	3	4	5	9
Scientific Graphics	1	2	3	4	5	9

The next few questions will help us gather specific information about NASA and AGARD technical reports.

11. About how many times this past year did you use a NASA technical report? An AGARD technical report?

Times used a NASA report _____

Times used an AGARD report_____

12. What percentage of the NASA technical reports **you** used in the past year were in:

paper _____%

microfiche _____%

13. During this past year, how frequently did **you** encounter the following problems: (Circle number)

OBTAINING NASA TECHNICAL REPORTS	Frequently				Never	Not Applicable
The library didn't own the report	1	2	3	4	5	9
The library owned the report but it was missing	1	2	3	4	5	9
The library owned the report but it was stored some place else on campus	1	2	3	4	5	9
The library staff was not cooperative or helpful in getting me the report	1	2	3	4	5	9

OBTAINING NASA TECHNICAL REPORTS

	Frequently				Never	Not Applicable
The report was classified or restricted	1	2	3	4	5	9
The report was available only to U.S. citizens	1	2	3	4	5	9
The report had to be obtained from either NTIS or NASA	1	2	3	4	5	9

Other (specify)_____

USING NASA TECHNICAL REPORTS	Frequently				Never	Not Applicable
Illegible microfiche	1	2	3	4	5	9
Illegible text	1	2	3	4	5	9
Illegible graphics (e.g., charts, photos, figures)	1	2	3	4	5	9
Poor report organization/ format/presentation	1	2	3	4	5	9
Intellectual quality of the research	1	2	3	4	5	9

Other (specify)_____

14. How would you rate NASA technical reports on each of the following factors?

	Excellent				Poor	Don't Know
ACCESSIBILITY: the ease of getting to the information source	1	2	3	4	5	9
EASE OF USE: the ease of comprehending or utilizing the information	1	2	3	4	5	9
EXPENSE: low cost in comparison to other information sources	1	2	3	4	5	9
FAMILIARITY OR EXPERIENCE: prior knowledge or previous use of the information source	1	2	3	4	5	9

Rate NASA Technical Reports

	Excellent				Poor	Don't Know
TECHNICAL QUALITY OR RELIABILITY: the information was expected to be the best in terms of quality, accuracy and reliability	1	2	3	4	5	9
COMPREHENSIVENESS: the expectation the information source would provide broad coverage of the available knowledge	1	2	3	4	5	9
RELEVANCE: the expectation that a high percentage of the information retrieved from the source would be used	1	2	3	4	5	9
PHYSICAL PROXIMITY: the distance to the information source	1	2	3	4	5	9
SKILL IN USE: the level of skill or skill mastery required to use the information source	1	2	3	4	5	9
TIMELINESS: the time allocated or available to produce a solution	1	2	3	4	5	9

The next group of questions asks about the importance of certain skills for professional success.

15. How important do you think it is for the professional success of **your engineering students** to communicate technical information effectively? (Circle number)

Very Important				Not at all Important	Don't Know
1	2	3	4	5	9

16. How important do you think it is for the professional success of **your engineering students** to have an understanding and knowledge of engineering information resources and materials? (Circle number)

Very Important				Not at all Important	Don't Know
1	2	3	4	5	9

Finally, we would like to collect some background information that will help us analyze the data.

17. Gender:

1 Female
2 Male

18. U.S. Citizen:

1 Yes
2 No

19. Highest level of education completed:

1 No degree
2 Technical or Vocational degree
3 Bachelor's Degree
4 Master's Degree
5 MBA
6 JD
7 PhD or Sc.D. in _____
8 Post Doctorate
9 Other (specify)_____

20. Were you trained as:

1 An Engineer
2 A Scientist
3 Other (specify)_____

21. Do you hold a faculty position:

1 Yes
2 No → Please skip to Q23.

Rank held:
1 Professor
2 Associate
3 Assistant
4 Adjunct
5 Instructor
6 Other (specify)_____

22. Tenured:

1 Yes
2 No
9 Not applicable

23. In the past year have you worked on a NASA or DOD grant or contract, other than the USRA "Advanced Engineering Design Program"? (Circle number)

1 Yes
2 No

24. Years of professional work experience in aerospace:

_____ Academia (or non-profit)
_____ Government
_____ Industry
_____ Total years

25. Professional Membership (Circle all that apply)

1 AIAA
2 ASME
3 IEEE
4 SAE
5 Other scientific, engineering or technical society _____
6 Not a member of any scientific, engineering, or technical society

26. During the past 3 years, have you authored or co-authored any NASA technical reports?

1 Yes → How many _____
2 No

27. During the past 3 years, have you attended NASA sponsored or co-sponsored conferences or workshops?

1 Yes → How many _____
2 No

28. In performing your duties as a faculty member during the past year, have you contacted or been contacted by NASA personnel?

1 Yes → How many _____
2 No

OVER

OPTIONAL QUESTIONS

1. What, in your opinion, is the biggest problem(s) faculty face in finding out and obtaining the results of NASA research?

_____

_____

_____

2. What suggestions can you offer for improving faculty access to the results of NASA research?

_____

_____

_____

3. Is there anything else you would care to say regarding this research?

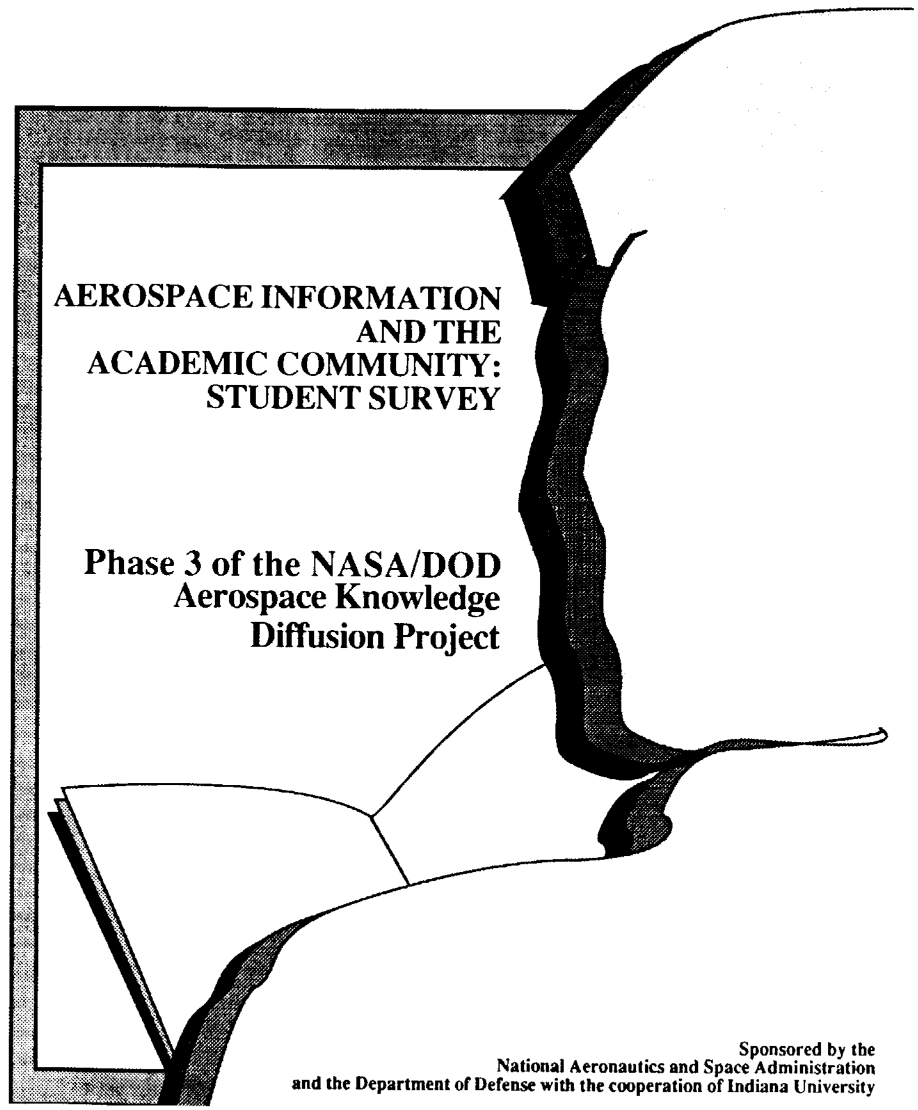
_____

_____

_____

Mail to:

Center for Survey Research
1022 East Third Street
Indiana University
Bloomington, IN 47405



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These data will help us determine the use and importance of information by engineering students.

1. How frequently during this past year did you use the following information **sources** to meet your engineering information needs? (Circle numbers)

	Frequently				Never	Not Available
Your personal collection of information	1	2	3	4	5	9
University library	1	2	3	4	5	9
Engineering or departmental library	1	2	3	4	5	9
Librarian	1	2	3	4	5	9
Your personal contacts within aerospace companies	1	2	3	4	5	9
Your personal contacts at NASA/DOD labs	1	2	3	4	5	9
Faculty members	1	2	3	4	5	9
Other students	1	2	3	4	5	9

2. How frequently during this school year did you use the following information **products** to meet your engineering information needs? (Circle numbers)

	Frequently				Never	Not Available
Conference/meeting papers	1	2	3	4	5	9
Journal articles	1	2	3	4	5	9
Handbooks	1	2	3	4	5	9
Textbooks	1	2	3	4	5	9
Computer programs and documentation	1	2	3	4	5	9
Bibliographic, numeric, factual databases	1	2	3	4	5	9
NACA reports	1	2	3	4	5	9

Frequency of use

	Frequently				Never	Not Available
NASA reports	1	2	3	4	5	9
DOD reports	1	2	3	4	5	9
AGARD reports	1	2	3	4	5	9
Foreign technical reports	1	2	3	4	5	9
Technical translations	1	2	3	4	5	9
Patents	1	2	3	4	5	9
Aerospace company technical reports	1	2	3	4	5	9
University technical reports	1	2	3	4	5	9
Informal information products (e.g., vendor/supply catalogs, company literature, trade journals/magazines)	1	2	3	4	5	9

3. How important are the following information **sources** in meeting your engineering information needs? (Circle numbers)

	Very Important				Not at all Important	Not Available
Your personal collection of information	1	2	3	4	5	9
University library	1	2	3	4	5	9
Engineering or departmental library	1	2	3	4	5	9
Librarians	1	2	3	4	5	9
Your personal contacts within aerospace companies	1	2	3	4	5	9
Your personal contacts at NASA/DOD labs	1	2	3	4	5	9
Faculty members	1	2	3	4	5	9
Other Students	1	2	3	4	5	9

4. How important are the following information **products** in meeting your engineering information needs? (Circle numbers)

	Very Important				Not at all Important	Not Available
Conference/meeting papers	1	2	3	4	5	9
Journal articles	1	2	3	4	5	9
Handbooks	1	2	3	4	5	9
Computer programs and documentation	1	2	3	4	5	9
Bibliographic, numeric, factual databases	1	2	3	4	5	9
Theses/dissertations	1	2	3	4	5	9
NACA reports	1	2	3	4	5	9
NASA reports	1	2	3	4	5	9
DOD reports	1	2	3	4	5	9
AGARD reports	1	2	3	4	5	9
Foreign technical reports	1	2	3	4	5	9
Technical translations	1	2	3	4	5	9
Patents	1	2	3	4	5	9
Aerospace company technical reports	1	2	3	4	5	9
University technical reports	1	2	3	4	5	9
Informal information products (e.g., vendor/supply catalogs, company literature, trade journals/magazines)	1	2	3	4	5	9

5. Approximately how many times during this school year have you used the following print sources in meeting your engineering information needs?

PRINT SOURCES	Times This School Year	Not Familiar With (✓)
Applied Science and Technology Index	_____	( )
Engineering Index	_____	( )

PRINT SOURCES	Times This School Year	Not Familiar With (✓)
Government Reports Announcement and Index	_____	( )
International Aerospace Abstracts	_____	( )
NASA SP-7037 (Aeronautical Engineering A Continuing Bibliography With Indexes)	_____	( )
NASA SCAN	_____	( )
NASA STAR	_____	( )
Science Citation Index	_____	( )

These data will help us determine the use of information technology by engineering students.

6. Approximately how many times during this school year did you use the following **electronic** sources in meeting your engineering information needs?

ONLINE (ELECTRONIC) DATABASES	Times this School Year	Not Familiar With (✓)
Aerospace Database	_____	( )
COMPENDEX	_____	( )
DTIC DROLS	_____	( )
INSPEC	_____	( )
NASA RECON	_____	( )
NTIS Online	_____	( )
SCISEARCH	_____	( )
Wilson Line Index	_____	( )
BRS including "After Dark"	_____	( )
DIALOG including "Knowledge Index"	_____	( )

7. Which of the following **best** characterizes your use of online electronic databases? (Circle number)

1 I do **all** searches myself
2 I do **most** searches myself
3 I do **half** by myself and **half** through a librarian
4 I do **most** searches through a librarian
5 I do **all** searches through a librarian
6 I do **not use** electronic databases

8. How likely would you be to use the following if they were provided in **electronic format**? (Circle numbers)

	Very Likely				Not at all Likely	Don't Know
NASA STAR on CD-ROM	1	2	3	4	5	9
Full text of NASA Technical Reports on CD-ROM	1	2	3	4	5	9
NASA Computer Program Listings on CD-ROM	1	2	3	4	5	9
NASA Numerical/Factual Data on CD-ROM	1	2	3	4	5	9
NASA Photographs (Images) on CD-ROM	1	2	3	4	5	9
Online system with full text and graphics for NASA technical reports	1	2	3	4	5	9

9. How frequently during this school year did you use the following **computer applications**? (Circle numbers)

	Frequently				Never	Not Available
Electronic databases	1	2	3	4	5	9
Laser/Video Disc/CD-ROM	1	2	3	4	5	9
Desktop/electronic publishing	1	2	3	4	5	9
Electronic bulletin boards	1	2	3	4	5	9
Electronic Mail	1	2	3	4	5	9
Electronic networks	1	2	3	4	5	9
FAX/TELEX	1	2	3	4	5	9

10. How frequently during this school year have you used the following **software**? (Circle numbers)

	Frequently				Never	Not Available
Word Processing	1	2	3	4	5	9
Spelling Checkers	1	2	3	4	5	9
Thesaurus	1	2	3	4	5	9
Grammar and Style Checkers	1	2	3	4	5	9
Outliners and Prompters	1	2	3	4	5	9
Business Graphics	1	2	3	4	5	9
Scientific Graphics	1	2	3	4	5	9

The next few questions will help us gather specific information about NASA and AGARD technical reports.

11. About how many times this school year did you use a NASA technical report? An AGARD technical report?

Times used a NASA report _____ Times used an AGARD report_____

12. What percentage of the NASA technical reports **you** used in the school year were in:

paper _____% microfiche _____%

13. During this school year, how frequently did **you** encounter the following problems: (Circle numbers)

OBTAINING NASA TECHNICAL REPORTS	Frequently				Never	Not Applicable
The library didn't own the report	1	2	3	4	5	9
The library owned the report but it was missing	1	2	3	4	5	9
The library owned the report but it was stored some place else on campus	1	2	3	4	5	9
The library staff was not cooperative or helpful in getting me the report	1	2	3	4	5	9
The report was classified or restricted	1	2	3	4	5	9
The report was available only to U.S. citizens	1	2	3	4	5	9
The report had to be obtained from either NTIS or NASA	1	2	3	4	5	9

Other (specify)_____

USING NASA TECHNICAL REPORTS	Frequently				Never	Not Applicable
Illegible microfiche	1	2	3	4	5	9
Illegible text	1	2	3	4	5	9
Illegible graphics (e.g., charts, photos, figures)	1	2	3	4	5	9
Poor report organization/ format/presentation	1	2	3	4	5	9
Intellectual quality of the research	1	2	3	4	5	9

Other (specify)_____

14. To what extent has each of the following factors influenced your use of NASA Technical Reports? (Circle numbers)

Rate NASA Technical Reports	Greatly Influenced				Not Influenced
ACCESSIBILITY: the ease of getting to the information source	1	2	3	4	5
EASE OF USE: the ease of comprehending or utilizing the information	1	2	3	4	5
EXPENSE: low cost in comparison to other information sources	1	2	3	4	5
FAMILIARITY OR EXPERIENCE: prior knowledge or previous use of the information source	1	2	3	4	5
TECHNICAL QUALITY OR RELIABILITY: the information was expected to be the best in terms of quality, accuracy and reliability	1	2	3	4	5
COMPREHENSIVENESS: the expectation the information source would provide broad coverage of the available knowledge	1	2	3	4	5

Rate NASA Technical Reports	Greatly Influenced				Not Influenced
RELEVANCE: the expectation that a high percentage of the information retrieved from the source would be used	1	2	3	4	5
PHYSICAL PROXIMITY: the distance to the information source	1	2	3	4	5
SKILL IN USE: the level of skill or skill mastery required to use the information source	1	2	3	4	5
TIMELINESS: the time allocated or available to produce a solution	1	2	3	4	5

The next group of questions asks about courses or instruction you might have received as part of your preparation to become an engineer.

15. Have you received instruction in technical writing? (Circle answer)

YES → Was the instruction? (Circle all that apply)

a. A credit course
b. A non-credit course
c. A required course
d. An elective course
e. As part of an engineering course
f. As part of another course
g. As a separate course
h. Other (specify)_____

NO → Was instruction in technical writing available to you? (Circle number)

1 Yes → What was your primary reason for not taking it?
2 No
3 Don't know

16. Have you received instruction in oral presentations? (Circle answer)

YES → Was the instruction? (Circle all that apply)

a. A credit course
b. A non-credit course
c. A required course
d. An elective course
e. As part of an engineering course
f. As part of another course
g. As a separate course
h. Other (specify)_____

NO → Was instuction in oral presentations available to you? (Circle number)

1 Yes → What was your primary reason for not taking it?
2 No
3 Don't know

17. Have you received instruction in how to use the engineering or departmental library ? (Circle answer)

YES → Was the instruction? (Circle all that apply)

a. A credit course
b. A non-credit course
c. A required course
d. An elective course
e. As part of an engineering course
f. As part of another course
g. As a separate course
h. Other (specify)_____

NO → Was instruction in how to use the library available to you? (Circle number)

1 Yes → What was your primary reason for not taking it? _____
2 No
3 Don't know

18. Have you received instruction in engineering information resources and materials ? (Circle answer)

YES → Was the instruction? (Circle all that apply)

a. A credit course
b. A non-credit course
c. A required course
d. An elective course
e. As part of an engineering course
f. As part of another course
g. As a separate course
h. Other (specify)_____

NO → Was instruction in engineering information resourcesand materials available to you? (Circle number)

1 Yes → What was your primary reason for not taking it? _____
2 No
3 Don't know

19. Have you received instruction in searching online (electronic) databases? (Circle answer)

YES → Was the instruction? (Circle all that apply)

a. A credit course
b. A non-credit course
c. A required course
d. An elective course
e. As part of an engineering course
f. As part of another course
g. As a separate course
h. Other (specify)_____

NO → Was instuction in searching online (electronic) databases available to you? (Circle number)

1 Yes → What was your primary reason for not taking it? _____
2 No
3 Don't know

20. How important do you think an understanding and knowledge of engineering information resources and materials will be to your success as an engineer? (Circle number)

Very Important 1 2 3 4 5 Not at all Important — Don't Know 9

21. How important do you think the ability to communicate technical information effectively will be to your success as an engineer? (Circle number)

Very Important 1 2 3 4 5 Not at all Important — Don't Know 9

Finally, we would like to collect some background information that will help to analyze the data.

22. Gender:

1 Female
2 Male

23. U.S. Citizen:

1 Yes
2 No

24.. Year:

1 Junior
2 Senior
3 Graduate Student
4 Other (specify)_____

25. COOP student: (Past or current)

1 Yes
2 No

OVER ——→

26. Major:

1 Aero/Astro Engineering
2 Architecture
3 Civil Engineering
4 Electrical Engineering
5 Mechanical Engineering
6 Ocean Engineering
7 Physics
8 Textile Engineering
9 Other Engineering (specify)_____
10 Other (specify)_____

27. In the past school year have you worked on a NASA or DOD grant or contract, other than the USRA "Advanced Engineering Design Program"?

1 Yes

2 No

28. Professional (national) student membership:

1 AIAA
2 ASME
3 IEEE
4 SAE
5 Other scientific, engineering or technical society _____
6 Not a student member of any scientific, engineering, or technical society.

OPTIONAL QUESTIONS

1. What, in your opinion, is the biggest problem(s) students face in finding out and obtaining the results of NASA research?

_____

_____

_____

2. What suggestions can you offer for improving students' access to the results of NASA research?

_____

_____

_____

3. Is there anything else you would care to say regarding this research?

_____

_____

_____

NASA
National Aeronautics and Space Administration

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John M. Kennedy and Terry F. White, Center for Survey Research, Indiana University, Bloomington, Indiana.

16. Abstract

Phase 3 of a four part study was undertaken to investigate the use of scientific and technical information (STI) in the academic aerospace community. Phase 3 of this project used three questionnaires that were sent to three groups (i.e., faculty, librarians, and students) in the academic aerospace community. Specific attention was paid to the types of STI used and the methods in which academic users acquire STI. This report focuses on the responses of two of the three groups: faculty in aerospace departments and students enrolled in USRA-funded capstone design courses and includes faculty and student frequency distributions. Respondents in both groups relied heavily upon informal sources of information, although students were less inclined to regard their personal collections of STI as important. Both groups relied upon most formal sources of STI about the same, but students reported more difficulty in using the formal resources.

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